GRC Environmental Programs Manual

Chapter 1 – Environmental Management System

NOTE: The current version of this Chapter is maintained and approved by the Environmental Management Office (EMO). The last revision date for this chapter is June 2004. If you are referencing paper copies, please verify that it is the most current version before use. The current version is maintained on the Glenn Research Center intranet at http://osat-ext.grc.nasa.gov/emo/pub/epm/epm-contents.pdf Approved by: EMO Chief, Michael Blotzer {mailto:Michael.J.Blotzer@nasa.gov}

1.0 GENERAL

This chapter describes the ISO 14001 compliant Environmental Management System (EMS) at NASA Glenn Research Center (GRC).

1.1 Purpose

This chapter describes GRC's Environmental Management System (EMS), which:

1. Actively involves senior management in support of the environmental management program.
2. Incorporates people, procedures, and work practices in a formal structure to ensure that the priority environmental impacts of the organization are identified and addressed.
3. Promotes continual improvement by periodically evaluating environmental performance.
4. Involves all members of the organization as appropriate.

The purpose of this EMS is to comply with and support the Agency EMS, and to establish a comprehensive approach to managing environmental activities for efficient, prioritized program execution. This document describes EMS procedures and references various documents demonstrating compliance and conformity with NPR8553.1/ISO 14001 requirements.

1.2 Scope

This Chapter provides overall direction for GRC to support the NASA commitment to environmental management. It applies to all organizational codes at GRC and related facilities. It serves as the main resource for effective implementation and maintenance of the Environmental Management System (EMS).

2.0 REFERENCES

2.1 Applicable Documents

- GLPD 8870.1C, Glenn Environmental Quality Program
- A complete listing of GRC documents applicable to EMS are listed in Appendix A, Cross Reference to GRC Documents (NPR8553.1/ISO 14001)
- Chapters of this manual included in the scope of this EMS are: 1-8, 15, 17-22, 25-27, 31, 32, 34, 36, and 38.

2.2 Records

The EMS records are found in the Organization Records List C-278 maintained in the BMS library.

3.0 DEFINITIONS

The Code of Environmental Management Principles (CEMP)	An Environmental Protection Agency (EPA) document comprised of five principles: • Management commitment • Compliance assurance • Pollution prevention enabling systems • Performance and accountability • Measurement and improvement
Competence	Means a body of skills (training, education, and experience) defined by the organization as appropriate for all personnel whose work might create a priority environmental impact.
Consequence	Associated with an environmental impact and is the resulting potential: (adverse or beneficial) effect on, or resulting change to: • A natural or cultural resource • A cost to NASA • The mission • Reputation or stakeholder relationship • Health and safety or • Environmental legal/regulatory implication. Consequences may occur as a component of normal operations where they are an expected result of regular planned operations. An abnormal consequence is associated with an unplanned or unexpected effect or change. An emergency consequence is associated with an emergency as defined by an installation in accordance with NPR 8715.2
Continual Improvement	The process of enhancing the environmental management system to achieve improvements in overall environmental performance in line with NASA's environmental policy and mission.
Document	A written procedure or guideline that requires regular maintenance or review.
Environmental Management System (EMS)	A system that incorporates people, procedures, resources, responsibilities, and work practices in a formal structure to address the development, implementation, achievement, and review of the environmental policy.
EMS Audit	A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether an organization is conforming to its environmental management system and for communicating the results of this process to management.
EMS Representative	The NASA individual who manages the EMS and is responsible for reporting to senior management and NASA HQ Code JE: EMS performance, results of functional assessments, audits, and management reviews.
EMS Continuous Improvement Operations Manager	The NASA individual, who manages the EMS day-to-day operations, makes and implements continuous improvements to the EMS and is responsible for assisting the EMS Representative.
Environment	The surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

Environmental Aspects	Elements of NASA's activities, products, or services that can interact with the environment. NASA has determined that these elements fall into four major focus areas: Prevention, Compliance, Restoration, and Conservation.
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from NASA's activities, products, or services.
Environmental Policy	A statement by NASA of its intentions and principles in relation to its overall environmental performance, which provides a framework for action and for the setting of its environmental objectives and targets.
Environmental Performance	Measurable results of the environmental management system, related to NASA's control of its environmental aspects, based on its environmental policy, objectives, and targets.
Environmental Objective	An overall environmental goal, arising from the environmental policy, that NASA sets for itself to achieve, and which is quantified where practicable.
Environmental Target	Detailed performance requirement, quantified where practicable, applicable to NASA, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.
External Communication	Any communication between GRC and external interested parties regarding environmental issues. It is meant to address inquiries from external parties comprehensively and systematically. Interested parties are individuals or groups with an interest in the environmental impacts of GRC's organization's products, activities or services. These parties include regulators, local residents, employees, stakeholders, insurers, customers, environmental groups and the general public.
Functional Assessment	Comprehensive, systematic, and documented verification, led by a headquarters team, of a functional area whereby evidence is obtained and evaluated to determine whether specific environmental activities, events, conditions, management systems, or information about these matters conforms with criteria.
ISO 14000	International standard and guidelines for environmental management tools and systems developed by the International Organization for Standardization.
Interested Party	Individual or group concerned with or affected by the environmental performance of an organization.
Legal and Other Requirements	Requirements that the organization is regulated to or has committed to meeting. These include local, State, Federal, Office of Management and Budget (OMB) circulars, Executive Orders, and international obligations (legal). They also include internal standards, agency agreements, presidential initiatives, industry codes or practice, contractual obligations, and non-regulatory guidelines.
NASA Online Directives Information System (NODIS)	Internet-based library of approved NASA directives enabling users to retrieve, view, and print NASA directives electronically.
Noncompliance	Failure to meet legal or other requirements.
Nonconformance	Failure to meet an EMS-specified requirement.
Operational Controls	Documented procedures that limit adverse impacts to the environment and are needed in order to manage NASA's environmental policy and compliance activities.

Prevention of Pollution	Use of processes, practices, materials or products that avoid, reduce or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution.
Priority Environmental Impact	A NASA environmental impact that must be managed to avoid or prevent a serious adverse environmental effect, or create a substantial beneficial effect. Within Federal government agencies such as NASA, compliance with the National Environmental Policy Act (NEPA) requires that if "major actions" might impose "significant environmental impacts," then measures for mitigating these adverse impacts must be identified and evaluated. To avoid confusion the NASA EMS will use the term "priority" instead of "significant" when describing environmental impacts.
Record	Written or printed object that cannot be revised and provides evidence of what was done or has occurred.
EMS Record	Record that has been identified as pertaining to the EMS.

4.0 ENVIRONMENTAL MANAGEMENT SYSTEM

4.1 GENERAL REQUIREMENTS

GRC is committed to the Environmental Management System as described in the NASA Environmental Management System (EMS) Procedures Manual (NPR8553.1) and in GRC Policy Directive (GLPD 8870.1C).

4.2 NASA GRC's ENVIRONMENTAL POLICY

GRC operates in a manner that preserves and protects the environment through pollution prevention, the continual improvement of our operations, and complying with regulations.

GRC reviews its environmental policy to ensure it is current and appropriate to its activities, products and services. To ensure knowledge and implementation of this policy, GRC communicates this policy to all employees and makes it available to the public. GRC also reviews current objectives and targets to ensure consistency with this policy.

4.3 PLANNING

4.3.1 Environmental Aspects and Impacts

The procedure used to develop a list of priority environmental aspects and impacts associated with GRC activities; products and services are found in Section 3.1 of NPG8553.1. GRC follows this procedure and priority environmental aspects are considered in setting objectives and targets. All changes in GRC activities, products and services are also reviewed to determine if they have priority environmental aspects and impacts.

A Risk Matrix Example Form is shown in Appendix B and is used to capture this information. The current completed GRC Risk Matrix form is maintained in the EMO Division Office files.

4.3.2 Legal and Other Requirements

GRC subscribes to a legal/regulatory email service through NASA HQ and takes action when appropriate. Access to current copies of relevant Federal, State, local laws and regulations and NASA requirements is maintained through electronic and/or hard copies available within EMO.

This Environmental Programs Manual contains guidance on regulations applicable to GRC's environmental aspects. This guidance follows United States Environmental Protection Agency (USEPA) and the Ohio Environmental Protection Agency (OEPA) environmental laws and regulations, respectively and can be found at these websites.

EMO maintains copies of all environmental permits, licenses and agreements. EMO also reviews compliance inspection results and corrects all deficiencies, including those related to legal and other requirements. The Center also subscribes to the following other environmental requirements:

- Member, Great Lakes and Northern Forest Cooperative Ecosystem Studies Unit.

4.3.3 Objectives and Targets

The procedure for dealing with objectives and targets is summarized in Section 3.3 of NPG8553.1. It is used to identify environmental objectives and targets and environmental management programs used to achieve them. The EMS Representative and the Operations Team identifies and prioritizes objectives and targets for management review and approval. All objectives and targets are consistent with the Environmental Policy. Progress towards achieving objectives and targets is evaluated at least annually. Results are reported to management and corrective actions implemented for activities or operations not meeting targets. GRC's records which relate to objectives and targets include, but are not limited to the following:

- Risk Matrix Example Form, Appendix B
- Current Objectives and Targets

Various programs are maintained to achieve the objectives and targets, and include the Employee Suggestion Award Program, which supports achievement of the pollution prevention and resource conservation targets and objectives.

4.3.4 Environmental Management Programs

GRC has environmental management programs maintained in the Environmental Program Manual for managing its objectives and targets. An Objectives and Target Plan is developed annually which describes the objective, related targets, the individual responsible for achieving the target, associated environmental program used to achieve the target, due dates, and performance indicators.

4.4 IMPLEMENTATION AND OPERATION

4.4.1 Structure and Responsibility

The procedure GRC uses is found in section 1.2 of NPG8553.1 and in the documents listed below. Since the overall effectiveness of the EMS depends on accountability of employees at all levels, GRC assigns these roles to knowledgeable and competent individuals and commits adequate resources to ensure success. Documented EMS roles are reviewed and kept current with respect to reorganizations, departures, new hires or new requirements.

Complete detail concerning structure and responsibility are described in the following documents:

- GRC-P3.10, Safety, Environmental, Security, and Emergency Preparedness Programs.
- EMO Organization Charts
- SAAD Annual Operating Agreement
- GRC-P8400.001, Environmental Management Office
- GRC-P8400.002, Programs and Processes

The EMS roles, responsibilities or functions are described below**:**

Center Director

- Assigns roles and responsibilities for the Center's EMS Representative.
- Provides the authority needed for the EMS Center Representative to implement and maintain GRC's EMS.
- Provides resources for the effective operations and maintenance of the EMS.
- Reviews Safety, Health and Environmental Board (SHEB) minutes, directing any concerns or questions on the SHEB's management review of EMS suitability, adequacy, and effectiveness to the Chair, SHEB.

Center Directorates

- Through the Safety, Health and Environmental Board (SHEB), reviews EMS periodically for status and viability.

Director, of Safety and Assurance (SAAD)

- Assigns roles and responsibilities for the Chief of the Environmental Management Office.
- Advocates for resources for the effective operation and maintenance of the EMS.

The Glenn Safety, Health, and Environmental Board (SHEB)

- . Establishes safety, health, and environmental policies for the Center.
- . Establishes guidelines to determine, accept, and manage the risks of all operations at GRC to ensure a safe and healthful workplace for all employees, and to preserve and protect the environment.
- . Serves as an appeal board for unresolved safety, health, and environmental issues concerning Glenn operations, reviews, evaluates, and resolves disputes.
- . Ensures that information about existing or potential safety, health, and environmental problems be made available to all appropriate Glenn employees and all levels of Glenn management.
- . Establishes and reviews safety, health, and environmental objectives and targets.

Chief, Environmental Management Office

- Serves as EMS Representative and is the GRC Environmental Manager.
- Requests resources for the effective operation and maintenance of the EMS.
- Researches and responds to environmental communications from the media and public, with the concurrence of the External Programs Directorate (EPD).
- Receives and responds to all communications from regulators, keeping EPD informed of the responses.

External Programs Directorate

- Receives all communication from the media and the public.
- Directs environmental questions and comments to the Environmental Management Office.

EMS Representative

- Documents and communicates roles, responsibilities, and authorities to facilitate effective implementation of the EMS.
- Requests resources for the effective operation and maintenance of the EMS.
- Exercises the authority necessary to implement and maintain the EMS.
- Establishes, implements, and maintains EMS requirements.
- Periodically assesses, reviews, and reports on the condition of the EMS.
- Reports to the SHEB on the results of audits, status and viability of the EMS.
- Reviews and updates (as necessary) objectives and targets. Where it was decided not to set objectives and targets to address high priority impacts a review of technical and economic feasibility will be completed.

EMS Continuous Improvement Operations Manager

- Assists EMS Representative.
- Assists in the effective implementation of the EMS.
- Manages resources for the effective operation and maintenance of the EMS.
- Exercises the authority necessary to implement and maintain the EMS.
- Assists in the facilitation of the EMS and coordination with BMS and ISO 9000.
- Assists in establishing, implementing, and maintaining EMS requirements.

Environmental Management Office Team Leaders

- Assist in the effective implementation of the GRC's EMS.
- Suggest resources for the effective operation and maintenance of the EMS.
- Exercise the authority necessary to implement and maintain the EMS.
- Assist in the facilitation of the EMS.
- Assist in establishing, implementing, and maintaining EMS requirements.

Environmental Program Manual Chapter Leads

- Conduct an annual review of applicable programs and chapters.
- Insure continuous improvement of programs.
- Maintain appropriate records.

Safety, Health and Environmental Training Committee

- Gathers input from all interested parties.
- Develops the environmental training plan for the center, in consultation with EMO.
- Provides input and feedback to Chief, Team Leads, and EMS Representatives.
- Maintains appropriate documents and records.
- Stays current on new regulatory training requirements in area of representation.

All Managers

- Provide resources to support EMS activities.
- Ensure staff with EMS responsibilities is trained, aware and competent.

All Employees and Contractors

- Understand the environmental aspects of their operation.
- Attend necessary training.
- Follow applicable procedures.
- Support other EMS activities.

Responsibility

Responsible Person or Organization	Activity
Center Director	Provides Senior Management oversight.
Director, Office of Safety and Assurance Technologies	Provides Senior Management oversight. EMS Senior Manager for management review.
Glenn Safety, Health, and Environmental Board (SHEB)	Sets environmental policies and leads management review. Serves as GRC's EMS Core Team.
Chief, Environmental Management Office	GRC Environmental Manager.
EMS Representative	GRC's EMS Lead. Coordinates with NASA HQ EMS Project Office.
EMS Continuous Improvement Operations Manager	Assists GRC's EMS Lead with EMS, BMS, and continuous improvement. Coordinates events and serves as Team Leader interface to ensure timely input. Assists in coordination with ISO 9000 Project Office. Assists with EMS audits. Oversees EMS\BMS interaction.
Environmental Management Office Team Leads	Provide input and assist in the EMS. Adopt EMS in normal business practices and supports the EMS lead and EMS Continuous Improvement Operations Manager.
Safety, Health and Environmental Training Committee	Lead role in interfacing with Training Office to ensure safety, environmental and security training is available to meet quality and EMS requirement.
ISO Project Office	Manages the development and implementation of the Center's Business Management Systems (BMS) and the ISO 9000 certification efforts.
All Managers and Employees	Follow appropriate procedures and work instructions for EMS.
NASA HQ EMS Representative	Develops EMS guidance and implementation at NASA HQ.

4.4.2 Training, Awareness, Competence and Environmental Awards

Training, Awareness and Competence

GRC management established a Safety, Health, Environmental, and Security Training Committee that follows GRC-P3.3.1, Training and Career Development.
Management and employees develop individual training and development plans.
The following documents provide additional information on training, awareness, and competence:

- GRC-P3.3.1, Training and Career Development.
- This Manual and Individual Development Plans.
- GRC-P3.3.1.1, On-the-Job Training Documentation.

In order to determine and track training needs the employee's supervisor will complete a training questionnaire. The completed form will be sent to the Safety and Environmental Offices for input into a training requirement and tracking system. Based upon needs identified the supervisor and employee will be notified concerning appropriate environmental, health and safety classes. The actual training an employee has completed will be tracked in the Human Resource Information System (HRIS) Database according to GRC-P3.3.1. The tracking system will include several items such as course title, completion date, and refresher course date, if applicable.

Environmental Awards

The environmental award portion of the Employee Suggestion Plan (ESP)/Employee Suggestion Award Program (ESAP) encourages everyone at GRC to do their part to minimize negative impacts to the environment. The environmental award portion will be administered through the Office of Human Resources (OHR) and EMO. Individuals and teams should submit and implement pollution prevention and resource conservation ideas. Everyone who submits an eligible suggestion or idea that reduces negative impacts to the environment will receive a gift from EMO and a $5.00 certificate from OHR. Higher value awards may be given to individuals or teams at GRC who also implement their ideas that reduce negative impacts to the environment.

Goals and Benefits of the Environmental Award Portion of the ESP/ESAP

1. Reduce negative impacts to one or more of the following: environment, cost, NASA mission, reputation, safety and regulatory compliance.
2. Facilitate achievement of GRC's environmental objectives and targets.
3. Encourage involvement in EMS activities.
4. Provide positive recognition for environmentally beneficial ideas and concepts.
5. Increase environmental awareness and communication at GRC.

Environmental Award Categories

1. Potential Opportunity Award - For ideas submitted which could help reduce negative impacts to the environment:
   a. EMO Provided Award - Recognition gift.
   b. OHR Provided Award - Certificate worth $5 toward purchase in Exchange Store or Cafeteria.
2. Environmental Improvement Award – Monetary award for ideas or suggestions implemented.
3. Environmental Improvement of the Year Award - One winner at GRC/year.

Environmental Award Evaluation Criteria

All suggestions and ideas will be evaluated to determine the potential to improve environmental performance in the following areas:

- Natural and cultural resources/environment
- Cost
- Mission
- Reputation and stakeholder relationships
- Compliance with regulations

Environmental Award Process

1. EMO communicates details of the new environmental portion of the ESAP program.
2. Individuals or teams send in Form C-9034 to OHR who will record and forward environmental ideas to EMO.
3. EMO will review the environmental ideas and will notify OHR which ideas will be implemented.
4. EMO will work with the individual, their supervisor and other relevant parties to help implement the idea.
5. Within one year after implementation, the individuals or teams will submit a report to EMO on their implementation progress, success, or lack of success.
6. The SHEB will select the Environmental Improvement of the Year Award and work with OHR and the Center Director to publicize and present.

4.4.3 Communications

GRC has developed internal and external communications procedures for meeting the GRC's EMS needs. These procedures are implemented and documented to ensure prompt responses to internal and external inquiries.

Internal Communications Process

PURPOSE

GRC's priority environmental aspects, environmental objectives and targets, and the environmental management system (EMS) are communicated to GRC personnel through the following media as appropriate.

PROCEDURE

The traditional flow of information from one management level to the next is appropriate and will be used for certain environmental information. The managers will instruct their employees to follow published procedures for specific applicable activities.

- Internal Newsletters
- Videos
- E-mail, Posters and Bulletins
- Employee Suggestion Program and Employee Help Line (38848 for environmental assistance and concerns)
- Special Events including the annual Earth Day Celebration program and periodic safety, health, and environmental promotions

External Communications Process

PURPOSE

This process is designed to promote communication of environmental issues to external stakeholders and to receive, consider and respond to inquiries from the public, media and other outside agencies.

PROCEDURE

General Public Communications

GRC has decided not to publicize the Center's environmental aspects. The Center will respond to public inquiries or requests on a case-by-case basis. The External Programs Directorate is the focal point for coordinating responses to all public inquiries. EMO will coordinate its response with the External Programs Directorate. All contacts will be documented to include the identity of the contact, the date and nature of the inquiry, and a summary and date of the response.

Media and Special Interest Group Communications

EMO will coordinate all contacts by the media with the External Programs Directorate. Both the EPD and the EMO will determine who should respond to the inquiry.

4.4.4. Environmental Management System Documentation

The documents that describe the GRC's EMS are NPR8553.1, GLPD 8870.1C and this Manual. These EMS related documents are kept current through annual or more frequent revisions, as needed.
All managers and employees will follow these documents:

- GRC-P3.7.2, Business Management System (BMS) Document Control and Data Control.
- GRC P3.7.2.1, Creation and Revision of the Quality Manual, Center Level Procedures, Lower Level Procedures, Work Instructions and Forms
- GLPD 1420.1A, Forms Management Program

For a complete listing of environmental management system documentation, records see Appendix A, Cross Reference to GRC Documents (NPR8553.1/ISO 14001) and the Organization Records List C-278 in the BMS library.

4.4.5 Document Control

The documents referred to in this chapter constitute the GRC procedures for EMS documentation and document control. GRC follows these procedures, reviews and updates them at least annually. Controlled copies of the documents may be in electronic form or in hard copies. In either case, these documents are made available to employees and others who may need them to carry out their EMS duties. Obsolete copies of controlled documents are removed from circulation immediately.

4.4.6 Operational Control

The EMS Representative and EMO staff verifies that operational control procedures are being followed. This verification is achieved through visual observation of EMS activities, interviewing employees implementing EMS and reviewing EMS records. The operational control procedures are designed to address all activities, products and services that result in priority environmental impacts. GRC revises these procedures at least annually.

For specific operational control documents, see Appendix A, Cross Reference to GRC Documents (NPR8553.1/ISO 14001).

4.4.7 Emergency Preparedness and Response

GRC uses the procedure noted below to prepare and respond to emergencies associated with its normal or abnormal operations. These procedures are kept current through updates following each major incident involving procedure implementation. The emergency preparedness and response procedures and plans at GRC can readily identify, prevent and mitigate EMS emergencies.

All managers and employees will follow these procedures. For specific emergency preparedness and response topics, see GRC-P3.10 Safety, Environmental, Security and Emergency Preparedness Program.

4.5 CHECKING AND CORRECTIVE ACTION

4.5.1 Monitoring and Measurement

All monitoring and measurement requirements are defined in individual EPM chapters and in environmental permits. All monitoring equipment is maintained and calibrated in accordance with GRC-P3.11.1, *Control of Inspection, Measuring, and Test Equipment*.

The monitoring and measurement methods are designed to be:

- Simple, flexible, and effective in producing reliable data.
- Supportive in yielding objective and verifiable environmental performance indicators consistent with GRC policies.
- Communicated to EMO, staff and stakeholders.

4.5.2 Nonconformance, Corrective and Preventive Action

The nonconformance, corrective and preventive action procedure GRC uses is referenced in the documents listed below. The EMS Representative and EMO staff ensures the implementation and maintenance of these procedures and track all non-conformances through corrective actions. Records generated are kept according to GRC policy.

For specific Nonconformance, Corrective and Preventive Action topics see GRC-P4.7, GRC Corrective and Action System. Although GRC-P4.7 does not specifically mention EMS, it is the offical system for EMS non-conformance and corrective and preventive action.

4.5.3 Records

GRC uses procedures described in Section 5.3 of NPG8553.1 and those listed below to manage its EMS records. The EMS Representative and EMO staff are responsible for making sure that these procedures are followed and they review EMS records at least annually to ensure they are legible, complete and traceable to a specific activity, product or service. The record retention procedure follows GRC policy as stated throughout GRC 3.7.3 Records Management.

4.5.4 Environmental Management System Audit

The Environmental Management System Audit program consists of the NASA HQ Environmental Functional Review described in NPR8553.1 as well as local internal audits performed according to the procedures described below. EMS audits are conducted according to the schedule and non-conformances noted are managed through the nonconformance, corrective and preventive action specified in Section 4.5.2 above. The process below is applicable to all internal audits performed by the EMS auditors to verify compliance to requirements and to verify the effective implementation of the GRC quality system and environmental management systems.

1. The EMS auditors will develop a schedule for the internal audit at least one month in advance.
2. Previous audit findings will be considered in developing the audit scope and focus. The EMS auditors will use an EMS Audit Matrix to determine the scope of an audit and the audit checklist in conducting audit (see Appendix C for examples).
3. The auditors will provide a summary report to appropriate managers.
4. The appropriate managers will fill out Corrective and Preventive Action Report Forms.
5. The Forms will be processed through the Corrective and Preventive Action process described in 4.5.2 of this chapter.

Auditor Qualifications

1. All auditors shall have successfully completed an ISO 14001 auditor training class.
2. Prior to participating in an audit, all auditors shall observe at least one audit.
3. Auditors will be independent of the organization, project, or process they are auditing.
4. Auditors will be free from bias and influences which could affect objectivity.

Records:

- EMS Audit Report
- Completed EMS Audit Matrix

Environmental Management System compliance is confirmed through the following routine audits and inspections:

- NASA HQ Functional Assessment.
- ISO 14001/NPR8553.1/EMS Internal Audits.

4.6 Management Review

A management review is done annually by the SHEB in accordance with Chapter 6 of NPR8553.1. The management review includes:

- The status and viability of the EMS.
- Results of environmental and EMS audits.
- Reviewing and updating objectives and targets as appropriate.
- Reviewing decisions to not set objectives and targets for high priority impacts for technical or economic reasons.

Metrics

Metrics are established for GRC's objectives and targets to ensure the EMS is properly implemented and maintained.

See Chapter 7 of NPG8553.1 for additional information on Agency-wide EMS metrics.

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Last update: June 2004

Objectives and Targets Plan for NASA Glenn Research Center FY 2004

Approved by the Safety, Health, and Environment Board, January 7, 2004

Objective	Targets	Assigned To	Program	Date Due	Performance Indicators & Metrics
Reduce the likelihood of spills and releases.	All personnel handling hazardous chemicals, waste, and petroleum products are trained in spill prevention procedures. Control or cleanup all spills within 24 hours.	P. Mobley	EPM Chap 8, 23, 24, 27, 38	9/30/2004 Within 24 hours of spill.	Percentage of personnel meeting HAZCOM, RCRA, SPCC, and Tank Manager training requirements. Number of spills and releases and number controlled or cleaned up within 24 hours.
Reduce hazardous materials use, waste, and pollution.	Implement six pollution prevention activities.	D. Papcke	EPM Chap 6	9/30/2004	Number of pollution prevention activities implemented
Comply with all regulatory requirements.	Correct or develop corrective action plan for all regulatory items of non-compliance within 3 months.	M. Blotzer	CPAR GRC-P4.7	Within 3 months of identifying violation	Number non-compliances. Percentage of non-compliances corrected or with corrective action plans within 3 months.
Reduce solid waste generation	Develop construction waste recycling program with quantifiable recycling goals. Meet recycling goal.	M. Bajorek	EPM Chap 5, 34	9/30/2004	% of recycling goal.
Exercise responsible stewardship for NASA controlled natural resources	Burn 100% of acreage identified by species management plan. Meet 100% of deer reduction goal identified by species management plan.	R. Lallier R. Lallier	PBS Species Management Plan.	9/30/2004	% of acres controlled by burns. % of target cull rate.

APPENDIX A
NPG 8533/ISO14001 CROSS REFERENCE TO GRC DOCUMENTS

NPG 85XX	ISO 14001 STANDARD	EMS/BMS DOCUMENTS * Numbers may change, this document is only a guide	LOCATION OF DOCUMENT
1	4.O. GENERAL		
	Initial Review/Assess.		**
	Linkage & Strategic Plan	GRC-P3.10, Safety, Env., Security, and Emerg. Preparedness, Rev. A	BMS Files on the Internet
2	4.2.ENVIRONMENTAL POLICY	EPM -1	Internet, entrances, building lobbies
3	4.3.PLANNING		
3.1	4.3.1.Environmental Aspects	Aspect/Impact Risk Matrix, EPM, NPG 8533 Draft	**
3.2	4.3.2.Legal/Other Requirements	EPM 1-6, 15, 17-22, 25-27, 32, 34, 36, 38	Internet
3.3	4.3.3.Objectives and Targets	Approved objectives and targets for GRC Process descriptions are in EPM Chapter 1	**
3.4	4.3.4.Environment Management Programs	GRC-8400.001, Environmental Programs Office and EPM Chapter 1 OSAT Annual Operating Agreement	Internet **
4	4.4. IMPLEMENTATION AND OPERATION	GRC-8400.002, Environmental Management Office Programs and Processes GRC-8400.003, Outreach GRC-8400.004, Environmental Programs Manual Procedures	
4.1	4.4.1.Structure & Responsibility		
	Organization	GRC-P3.10 Safety, Environmental, Security and Emergency Preparedness Programs, EMO Organization Charts	Internet
	Responsibilities	EPM - 1, Policy Document	Internet
	Financial Resources	GRC-P8000.004, ROS and PS Management Procedure GRC-P8000.006, C of F Management Procedure GRC-W8000.004, Training Budget GRC-W08000.005, Travel Budget GRC-W08000.002, Awards/Recognition GRC-W08000.003, SAAD IT Planning GRC-W08000.001 SAAD - AOA	BMS library BMS library BMS library BMS library BMS library BMS library
4.2	4.4.2.Training and Awareness & Competence		
	Training Program	GRC-P3.3.1 Training and Career Development, EPM & Individual Development Plans GRC-P3.3.1.1 On-the-Job Training Doc.	Internet
	Awareness Program	Training and Communication Team Activities/Implementation Schedule.	Various
	Information Resources	Internet, Link, Aerospace Frontier, Electronic Board,	**
	Recognition	GLPG 3451.1 4.3; Employee Suggestion Program	
4.3	4.4.3.Communications	Outreach Program	
	Internal	EPM -1, EMS Web Site	Internet and various locations**
	External	EPM -1	
4.4	4.4.4.Environ. Documentation	GRC 3.7.2 Business Management System Document and Data Control GLPD 1420.1A Forms Management GRC 3.7.3 Records Management GRC P 3.7.2.1 Creation & Revision of Center Level Procedures, Lower Level Procedures & Work Instructions	S Drive, Internet
4.4	4.4.5.Document Control	GRC 3.7.2 Business Management System Document and Data Control GRC-P3.7.3, Records Management	Internet
4.5	4.4.6.Operational Control	EPM Chapters 1-6,15, 17-22, 25-27, 32, 34, 36 and 38	Internet
	Vendor Controls	EPM-5	Internet
	Review & Approval	EPM-22	Internet
	Prev. of Pollution	Same as 4.5 above and P2 Plan	Internet and **
	Chemical Handling & Minimization	EPM-21	Internet and **
	Haz. Waste Handling & Minimization	P2 Plan. Laboratory Standard Operating Procedure EPM-5&6	Internet and **
	Gen. Waste Handling	P2 Plan	Internet **

APPENDIX A
NPG 8533/ISO14001 CROSS REFERENCE TO GRC DOCUMENTS

NPG			ISO 14001 STANDARD	EMS/BMS DOCUMENTS	LOCATION OF DOCUMENT
85XX				* Numbers may change, this document is only a guide	
		& Minimization		EPM 17	
4.6	4.4.7.Emergency Preparedness			GRC-M 0550.001A Emergency Preparedness Program	
		Emergency Respon.			
		Disaster Recovery			
5	4.5. CHECKING AND				
	CORRECTIVE ACTION				
5.1	4.5.1.Monitoring & Measurement			EPM - 1, 3, 4, 32	Internet
		Needs Assessment			EMO Office
		Data Collection		Calibration - ISCO Bubbler Flow Meter Calibration Procedure, Autocalibration	Internet
				for pH Meter Procedure, AA Win Lab Online; Calibration Procedures	
		Data Analysis			Internet
5.2	4.5.2.Non-conformance and				
	Corrective/Preventative Action			GRC-P 4.7, Corrective and Preventative Action.	
		Non-conformance		GRC-P4.6 Internal Audit-Rev.F.	Internet
		Correction			Internet
		Preventative Action			Internet
5.3	4.5.3.Records			C-278 Organizational Records List	
		Creation/Distribution		GLPD-1420.1, Records Management	Internet
		Maintenance		GRC-P3.73, Records Management	Internet
5.4	4.5.4.EMS Audits			GRC-P4.6 Internal Audit	
		Plans		HQ Audit Schedule. BMS Form F-1	**
		Procedure/Process		EPM, Chapter 1	Internet
		Reports/Reporting			**
		Tracking/Follow-up			
6	4.6.MANAGEMENT REVIEW			EPM, Chapter 1	Internet
		Evaluation Process			
		Continual Improvement		Continuous Improvement Manager Function, NPG 8553.1	**
7	METRICS			EPM, Chapter 1	
KEY	SHEB=	Safety, Health & Environmental Board			
	NPG = HQ NASA Procedures and Guidelines - Environmental Management Systems Procedures Manual				
	BMS = Business Management System				
	EMS = Environmental Management System				
	GLPD = Glenn Policy Directives				
	GLPG = Glenn Procedures and Guidelines				
	GRC = Glenn Research Center				
	EMO = Environmental Management Office of GRC				
	EPM = Environmental Programs Manual				
	* = Most of the EMS standards are met in Chapter 1 (EPM - 1) of Environmental Programs Manual (EPM).				
	** = Documents are on the the S Drive, CD, or EMO official file				

APPENDIX B: Risk Matrix Form
3/1/04

Org. Code	Major Activity	Bldg #	Activity, Product or Service	Identified Impact	Grouped Impact OPS	Categorized Aspect	Categorized Focus Area	Environmental Consequence	Severity	Frequency	Overall Risk Rank	O & T

APPENDIX C EMS AUDIT MATRIX

Lead Auditor: Date: Organization: Page of

Environmental Programs Manual Reference	4.2 Environmental Policy	4.3.1 Environmental Aspects	4.3.2 Legal & Other Requirements	4.3.3 Objectives & Targets	4.3.4 Environmental Management Programs	4.4.1 Structure & Responsibility	4.4.2 Training Awareness & Competence	4.4.3 Internal & External Communications	4.4.4 EMS Documentation	4.4.5 Document Control	4.4.6 Operational Control	4.4.7 Emergency Preparedness & Response	4.5.1 Monitoring & Measure	4.5.2 Non Conformance & Corrective & Preventative Actions	4.5.3 Records	4.5.4 EMS Audits	4.6 Management Review
BRANCH, LAB, PROJECT	**Applicable Elements** (Mark with an "X" and then shade or circle the elements to be added)																
Notes:																	

Appendix C: Environmental Management System Audit Matrix and Checklist

NASA GRC Environmental Management System Audit Checklist ***4.2 Environmental Policy***		
	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		
Question: How is NASA GRC environmental policy implemented across the Center and communicated to all employees?		
Center Response:		
Description of Observation/Finding/Other Notes: *Can randomly selected employees explain what the policy means to them and do they know where to get a copy?* *Is there a plan ensuring that all levels of the organization are familiar with the policy?*		
Auditor Signature:	☐ Notes continued on other side Date:	

NASA GRC Environmental Management System Audit Checklist ***4.3.1 Environmental Aspects and Impacts***		
	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
How has the Center defined control and influence and followed the steps required to identify activities, products, services, focus areas, aspects, impacts, consequences, frequency, and risk ranking prescribed in paragraph 3.1 of the Agency EMSPM which result in completion of the risk matrix form?

How does the Center identify environmental risk in order to develop management strategies?

Center Response:

Description of Observation/Finding/Other Notes:

R *Review the Center management definition of control and influence to assess its comprehensiveness.*

Review any Center specific processes **P** *used to complete the risk matrix for. If the Center has documented these processes they are subject to controls.*

R *Both the risk matrix form and any recorded justification and background for risk rankings should be reviewed for completeness and for uses across NASA.*

Ensure through interviews and documentation reviews that a comprehensive impact identification and classification process exists.

Ensure processes are in place to keep the risk matrix form up to date.

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.3.2 Legal and Other Requirements

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
How does the Center ensure that the legal and other requirements directly applicable to the environmental impacts associated with its activities, products, and services have been identified, are integrated into Center programs and the implementation of NASA Policies, and are communicated to appropriate individuals? This includes providing access and tracking.

How are new or changed requirements incorporated into operating procedures?

Center Response:

Description of Observation/Finding/Other Notes:

P *Examine the procedure(s) that the center uses to:*

- *Identify existing, new, and changes to legal and other requirements, using NASA-wide, Center-specific, and additional resources.*
- *Determine whom needs to know and how they are kept informed.*
- *Keep track of the requirements (document controls apply if Center has deemed procedures need to be documented in order to ensure they are followed)*

Any interpretations generated on applicability of legal requirements, Center specific permits / agreements, or related training are records. **R** *However, unless the Center deems it appropriate to maintain internal records of which legislation applies at different time periods then the actual laws and regulations are a matter of public record and need not be treated as EMS records.*

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.3.3 Objectives and Targets

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
What process does the Center use for setting objectives and targets?

What factors are considered in setting them?

How are they reviewed?

Center Response:

Description of Observation/Finding/Other Notes:

D *Review Center objectives and targets, for high priority impacts and any other impacts for which the Center has decided objectives and targets are appropriate.*

If objectives or targets were not set for high priority impacts based on technical feasibility or economic reasonability, review record. **R**

Determine how the Center has considered: legal and other, technology, operational, mission, financial, and stakeholder issues in setting objectives and targets. If a formal process was undertaken there may be records.

Get the Center to explain how it ensures objectives and targets align with the NASA environmental policy and continual improvement?

Staff should have a consistent answer regarding when and how objectives are reviewed and updated.

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.3.4 Environmental Management Programs

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
Describe the Center's environmental management programs (EMPs) and supporting guides, procedures, etc. and how they address the objectives and targets.

How do the EMPs ensure NASA wide programs are addressed? Include environmental program initiatives such as NEPA related assessment activities.

Center Response:

Description of Observation/Finding/Other Notes:

Review the Center processes on how EMPs reflect the progression from:

- *identification of new or modified activities, products, and services,*
- *identification of new or modified aspects and impacts, and their prioritization, and*
- *setting of objectives and targets. If established documented procedures for program development are present and deemed necessary by the Center then the procedures are subject to document controls.*

Review the Center generated list of all EMPs **D** *and selectively review EMPs with Center personnel.*

Confirm that all high priority impacts are sufficiently covered.

Do EMPs include detail on who is responsible, resources, and timelines? Do these appear to be realistic and sufficient? Does the affected staff agree?

How do the programs highlight and address compliance requirements? Including NEPA and environmental justice where applicable, is it the exception or the norm that these requirements are followed?

Review program initiatives and have environmental staff detail how EMPs and their activities are included in all working areas of the Center (such as programs, design and construction).

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.4.1 Structure and Responsibility

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:

At the Center, how are environmental management roles, responsibilities, and authorities defined, documented, and communicated for all appropriate organizational levels? Is there **"stop work"** authority within environmental responsibility?

Describe your environmental civil service staff and their assigned environmental programs.

How does Center management ensure adequate resources are provided for the EMS?

How does the environmental management teams or working group provide cross-organizational support?

Center Response:

Description of Observation/Finding/Other Notes:

Review documentation of roles and responsibilities (R and R) for the EMS. **D** *Review these for key environmental staff, the EMS representative, and the EMS core team or equivalent.*

When interviewed, do staff's impressions of their R and R align with those they have been assigned? How have their R and R been communicated to them? Specifically R and R with the EMS representative/ EMS core team or equivalent.

Does it appear that management ensures adequate resources have been provided for the EMS and its maintenance in accordance with the EMSPM?

- ⇒ *issues/problems due to insufficient staff;*
- ⇒ *how you assess environmental staffing needs (i.e., excessive overtime, excessive use of contractors, compliance deficiencies);*
- ⇒ *degree of success in gaining approval for additional staff and why;*
- ⇒ *programs not being undertaken due to insufficient staff; and*
- ⇒ *issues regarding how contractor staff and "inherently governmental functions" are managed.*
- ⇒ *Resources/funding available for studies, research, and environmental maintenance activities*

Is there a clear line of authority leading from top management to overall programs and to detailed program execution with accountability? Is there evidence that things actually work the way the roles and responsibility documentation say they do? Evidence could be records of communications or instructions, for example, of how resources for a new or changed program were developed.

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.4.2 Environmental Training Awareness and Competence

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:

Describe the process used to identify training needs of all personnel whose activities may result in consequences associated with high priority impacts or compliance activities

Describe the procedures for and content of employee awareness training.

How does the Center ensure personnel whose activities may result in consequences associated with priority environmental impacts or compliance activities are competent on the basis of appropriate education, training, and/ or experience?

Center Response:

Description of Observation/Finding/Other Notes:
Review Center procedures for identification of training needs, requirements for awareness training, and ensuring competence of staff whose activities are associated with high priority impacts. **P** *What triggers recognition of a new training need (internal or external)?*

The training procedures should ensure that needs once identified are correlated with appropriate training programs that are completed and whose effectiveness is monitored.

Are training and records **R** *of training complete and up to date? Crosscheck selected records with interviewed staff.*

How does the Center ensure that support organizations including on-site contractors are appropriately trained and aware?

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.4.3 Communications

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
Describe existing communication procedures for communication with internal and external parties.

Center Response:

Description of Observation/Finding/Other Notes:
To assess the effectiveness of internal, communications review the quantity and nature of recent communications from management down and operational levels up as well across the organization. This should include the environmental office as well as EMS-related communications not driven by the environmental office.

Assess the effectiveness and access of internal communication from the environmental staff up the chain to senior management (Center Director/Deputy level).

Review recent communications between the Center and outside stakeholders including regulatory agencies.

What procedure **P** *exists for communicating the Center environmental impacts to external parties.*

What communications procedures are used? **P** *Determine if they are actually followed via review of records and interviews.*

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.4.4 and 4.4.5 EMS Documentation and Document Control

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
Describe how plans and procedures are managed.

What process is in place to ensure that for all environmental handbooks, environmental management programs (EMPs), guidance materials, and standard operating procedures, these are complete and maintained? How are internal relationships among these documents tracked and understood?

Center Response:

Description of Observation/Finding/Other Notes:
The Center should have a formal process for the development, approval, and maintenance of procedures and documentation. **P** *Review a subset of the EMS documents to determine if they are within a document control system and are the current versions located where they are needed. What evidence exists of steps being taken to ensure that only current and appropriate documents are used? Review disposition of obsolete documents.*

Do users and authors (at Center-wide and operational control levels of the organization) understand how the document control system works and their roles?

Review documentation that explains how the core Center level EMS documents interact and provides direction to related EMS documentation. **D**

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.4.6 Operational Control

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
Does the Center have documented procedures established and maintained to address situations where the absence of such procedures could lead to deviations from environmental policy, objectives, targets, and compliance activities?

Describe how these procedures stipulate specific operating and maintenance criteria.

What procedures are needed in relation to suppliers, contractors, and tenants and how are these requirements met?

Center Response:

Description of Observation/Finding/Other Notes:
Review the listing of operational control procedures supplied by the Center for completeness and consideration of how well the procedures function as part of the management of environmental impacts and consequences. **D** *When examining the procedures look for actual operational and maintenance criteria.*

Examine the process that the Center uses to decide what operational controls are required and how the adequacy of these controls is maintained. How proactive versus reactive is this process?

How are operational controls for suppliers and contractors developed and communicated (within Center Control and Influence limits) and are the controls actually part of how things get done? Where practical, interview selected contractors and suppliers.

Examine how well the Center understands if it s tenancy agreements and any informal arrangements align with Center objectives and targets and the overall EMS.

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.4.7 Emergency Preparedness and Response

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
Are procedures developed and maintained to prevent and mitigate environmental impacts associated with accidental releases?

How does the Center review and revise emergency response plan procedures after an incident to address deficiencies?

How frequently does the Center test its plan?

Center Response:

Description of Observation/Finding/Other Notes:

Review the emergency response plans and procedures. **P** *Assess how comprehensive the scope of potential releases considered in the development of the plans is relative to the list of impacts in the EMS risk matrix form.*

Examine any revisions to the plans, as a result of tabletop reviews **R**, *actual incidents, or new internal or external information.*

How actively does the center pursue opportunities to improve in this area? Examine the Center's annual review of emergency preparedness procedures.

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.5.1 Monitoring and Measurement

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
Describe the system used and documented procedures to inspect, test, monitor, track, and measure key characteristics of operations associated with EMS objectives and targets and high priority impacts.

Describe processes for calibration of monitoring equipment.

Center Response:

Description of Observation/Finding/Other Notes:

Review monitoring and measurement plans and procedures. **D**

Was a comprehensive process undertaken to identify characteristics of operations that need monitoring or measuring? This should include contractors, tenants, and any areas where operational controls have been identified as needed.

Review records **R** *on progress towards meeting objectives and targets or maintenance of performance in already managed areas.*

Review record **R** *keeping and sample records to see if monitoring is being conducted in accordance with procedures.*

Do calibration processes and records for EMS related equipment exist? **D** *and* **R** *Note: ISO 9000 models for calibration are one possible method to follow.*

How is periodic trend analysis of corrective and preventive actions accomplished? What trends were found (if any)?

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.5.2 Nonconformance, Corrective and Preventive Action

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:

Describe Center procedures for nonconformance and corrective /preventive action.

How does the Center ensure that corrective or preventive actions are appropriate to the environmental impact?

What tracking and record keeping is done in association with these processes?

How are these processes connected with auditing and management review processes?

Center Response:

Description of Observation/Finding/Other Notes:

Review the corrective and preventative action procedures. **P** *These should include actions from Center, HQ, and external parties resulting from monitoring and measuring programs, periodic reviews/audits of the EMS, and management reviews.*

Review how corrective action requirements are identified. In interviews are staff typically aware of the corrective and preventive action process and how it is an integral part of continuous improvement?

Determine if proactive preventive steps are in place that look: internally and externally beyond the Center and NASA.

Are actions tracked to completion and feedback provided on progress towards resolution? Follow a couple of actions from identification of an issue, through any root cause analysis, determination of course of action, assignment of responsibility, authority and resources, through to completion. This should be recorded in changes in documented procedures. **R**

How is periodic trend analysis of corrective and preventive actions accomplished? What trends were found (if any)?

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.5.3 Records

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:

What record types and record keeping systems are in use? How does the Center ensure they are all properly controlled?

How are records maintained so that they can be traced to an activity, product, or service?

Center Response:

Description of Observation/Finding/Other Notes:

Review selected EMS records in different record keeping systems and look for consistencies in approach and controls as an indicator of maturity of systems. Auditable records are:

1. *Priority Impact Risk Matrix.*
2. *EMS Training Records.*
3. *Compliance activity records in accordance with Legal and Other requirements.*
4. *Calibration and maintenance records.*
5. *Management review results.*
6. *Results of test of emergency response procedures.*
7. *Decision with regard to external communication of High Priority Impacts.*
8. *Changes in the documented procedures resulting from corrective and preventive action.*
9. *Any additional records listed in the Center's records retention matrix or Center EMS procedures*

Review records maintained by NASA staff as well as contractors.

What steps taken to allow records to be traced to the specific activity, product, or service? Crosscheck a few records to confirm that records can be traced.

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.5.4 EMS Audit

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:

Describe Center internal audit systems.

Outline documented Center programs and procedures for review of compliance with environmental legislation and regulations.

Describe the Center's processes for acting upon the results of compliance reviews, HQ Environmental Functional Reviews, and external audits.

Center Response:

Description of Observation/Finding/Other Notes:

Review recent Center internal EMS audit and review audit results. **R** *Was a planned audit or assessment procedure* **P** *used and followed? How were results integrated into the Corrective/Preventive Action system?*

How did the audit assess conformance with the commitments required by the EMSPM and by the Center's EMS documentation and procedures? (For example: did selected elements of the management system get reviewed or were all elements reviewed?) Does the procedure increase audit frequency in problem areas?

How did the results get conveyed to management?

Examine the compliance review process. Does it look at areas where a non-compliance may not exist at present but could, and does the review include recommendations for improved performance.

Are trends in EMS non-conformances or regulatory non-compliance identified for further examination?

How are findings from internal, HQ, and external audits and reviews integrated into the preventive and corrective action system?

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.6 Management Review

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:

Describe the mechanism used for Center level management to review and act upon reviews, audits, assessments, and other information deemed appropriate by management, in determining whether environmental policy, objectives, targets, or other EMS component changes are required.

Describe communications processes and roles related to management reviews.

Center Response:

Description of Observation/Finding/Other Notes:
In order to understand what information senior management is provided for making decisions follow the process of preparation of EMS information for Center-level management review.

Documentation of the review **R** *and how changes in Center-level EMS elements are directed by management should be examined to see that that top Center management is involved in the review.*

Check that a follow up process occurs.

Auditor Signature:	☐ Notes continued on other side Date:

NASA GRC Environmental Management System Audit Checklist
4.6 Metrics

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:
What metrics does the Center utilize in its EMS reviews? Are they workload, performance, or data metrics?

What EMS changes have been instituted based on the review of metrics?

Center Response:

Description of Observation/Finding/Other Notes:
How useful is the information the metrics provide? Do the metrics need to be normalized?

Is the behavior that each metric encourages understood by the Center and is it desirable?

Auditor Signature:	☐ Notes continued on other side Date:

NASA HQ Environmental Functional Review Auditor Checklist Additional

	Date:	Page ___ of ___ for this Question
EMS Auditor:	Escort:	
Others in Attendance:		

Question:

Center Response:

Description of Observation/Finding/Other Notes:	
Auditor Signature:	☐ Notes continued on other side Date:

3-22-2001

GRC EMS TRAINING NEEDS ASSESSMENT

1. Environmental Training, Awareness, and Competence/Training Survey Implementation Plan

GRC assesses training needs of all personnel whose activities products and services have impact on the environment through an environmental health and safety (EH&S) training questionnaire developed by the Environmental Management and Glenn Safety Offices (EMO and GSO). Supervisors and their employees complete this questionnaire to identify EH&S training needs and the training awareness requirements to maintain competence for the environmental management system (EMS). Questionnaire results are submitted to EMO and GSO for review, analysis and course scheduling.

EMS training needs identification and implementation schedule is as follows:

1. On 2-16-01, EMO and GSO sent letters with a questionnaire to supervisors to identify training needs.
2. On 3-30-01, EMO and GSO expect to receive questionnaire results from all of the supervisors. For non-responsive supervisors, EMO and GSO will issue a corrective and preventative action report (CPAR) to require full compliance. The CPAR's due date is 4-30-01.
3. By 5-30-01, EMO and GSO will have completed the review and analysis of questionnaires, identified employee-specific training needs, issued a training schedule, and selected required fields for the training record in a relational database.
4. By 6-30-01, EMO and GSO will have input EMS training data in a relational database such as Microsoft Access.

2. EMS Training Requirements & Implementation

EMO is responsible for determining EMS training needs, conducting EMS training as required at each relevant organizational code, verifying and recording that the necessary EMS training has occurred. To date EMO has determined that employees engaged in activities associated with EMS impacts or compliance activities require EMS training. Specific EMS training classes or subjects for these employees include:

- General EMS Awareness Training
- ISO 14001 Internal Auditor Training
- Specific training on certain EMS programs
- Priority environmental impacts associated with work and benefits of improved environmental performance
- Requirements of the EMS
- GRC's environmental policy
- Roles and responsibilities in conforming to the environmental policy and EMS requirements and awareness of consequences of deviation from these requirements, and
- Emergency preparedness and response requirements

Training is available on various environmental subjects. Contact your supervisor or Mike Goin, Training Branch, Office of Human Resources at 3-6633 to arrange the appropriate training.